Community	Current Treatment Technology	Would the criteria apply? Or is there dilution capability?	Design Flow (MGD)	Actual Flow (MGD)	Community Population (Census 2010)	Number of Households (American Community Survey 2005-2009)	Median Household Income (2010) - American Community Survey.	Current average household sewer bill per year (2008 / 2011)	Current average sewer fee as % of MHI	Notes	Capital cost (million dollars) to meet the numeric nutrient criteria (WERF)	Annual Capital cost to meet the numeric nutrient criteria (L4 WERF)	Annual Operations costs to meet the numeric nutrient criteria L4WERF	Annual Capital and Operations cost ($)	Annual Additional Cost per Household (increase in sewer rate)	Predicted average household sewer fee to meet criteria	Expected % MHI to Meet Base Numeric Nutrient Criteria (plus current wastewater fees)	Scenario A	Scenario B	Percent increase in Wastewater bill	
Kalispell	BNR (modified Johannesburg); 3.1 to 5.4 MGD; avg. .12 mg/l TP; 10 mg/l TN.	Yes. EOP; Ashley Creek	5.4	3.10	19,927	7,705	$39,953.00	$361.68	0.91%	Sewer rates obtained from City in 2011. Plant ~WERF Level 2.	84.24	$6,756,048	$1,782,965	$8,539,013	$1,108	$1,470	3.68	4.73	4.01	306%	
Bozeman	some BNR now; 5-stage Barrdenpho; new plant will be BNR (1 mg/l TP; 3 mg/l TN starting in 2011); current 5.8 MGD; increasing to 13.9 mgd	Yes. Also Gallatin TMDL in the works.	13.8	5.80	37,280	14,614	$41,661.00	$372.00	0.89%	Sewer rates obtained from City in 2011. Plant ~WERF Level 2. Really Level 3 for TN and 1 for TP	215.28	$17,265,456	$3,335,870	$20,601,326	$1,410	$1,782	4.28	5.64	4.70	379%	
Helena	BNR; 3 mg/l TP; 10 mg/l TN; design capacity of 5.4; current discharge ~3.0 MGD	Yes. WLA set in TMDL based on numeric criteria.	5.4	3.00	28,190	12,337	$47,152.00	$277.80	0.59%	Sewer rates obtained from City in 2011. Plant ~ WERF Level 1.	102.60	$8,228,520	$1,834,950	$10,063,470	$816	$1,094	2.32	3.00	2.53	294%	
Butte	Current technology is activated sludge (TN of 18.5 mg/l; TP of 2.11 mg/l); under Order to Construct to membrane BNR; current design is 8.5 MGD; talking about lowering to 6.1 MGD. Sewer Fee based on DEQ estimtes. Included in current fee is $27 million upgrade in new capital costs and $1.125 million in O&M costs which would bring them to 5 TN and 0.1 TP	Yes. EOP.	8.5	4.00	33,525	14,041	$37,335.00	$360.00	0.96%	Sewer Fee based on DEQ estimtes. While current monthly fee is $13.50, the $27 million upgrade in new capital costs plus $1.125 million in additional O&M costs which would bring them to 5 TN and 0.1 TP (WERF 3) would raise rates to $30 per month	118.15	$9,475,630	$1,877,200	$11,352,830	$809	$1,169	3.13	4.00	3.40	225%	
Billings	2ndary treatment; Design flow of 26 MGD (avg.) and 40 MGD max.	Yes. Discharge into the Yellowstone River.	26	26	104,170	41,841	$45,004.00	$218.28	0.49%	The numbers for Billings and Great Falls (treatment levels, treatment costs etc.) were obtained from HDR.	312.50	$38,095,000	$15,902,900	$53,997,900	$1,291	$1,509	3.35	4.32	3.66	591%	
Missoula	advanced secondary treatment facility with biological nutrient removal and ultraviolet disinfection; meets Clark Fork criteria w/ mixing zone. 8.2 mg/l TN; 0.16 -0.4 mg/l TP; get a mixing zone, meeting criteria currently. BNR. Design flow = 12 MGD ; actual flow = 9 MGD. (designed for 10 and 1). (HDR)	Yes. With mixing zone. Currently meeting criteria after mixing zone.	12	9	66,788	27,553	$34,319.00	$152.14	0.44%	Sewer rates obtained from city. 2011 values.	88.80	$7,121,760	$2,614,050	$9,735,810	$353	$505	1.47	1.83	1.59	232%	
Great Falls	conventional 2ndary activated sludge (max 21-MGD; avg. 10 MGD)	Yes. Missouri River	26	26	58,505	23,998	$40,718.00	$187.20	0.46%	At WERF 1. The numbers for Billings and Great Falls (population, treatment levels, etc.) were obtained from HDR.	312.50	$38,095,000	$15,902,900	$53,997,900	$2,250	$2,437	5.99	7.86	6.57	1202%	
Livingston	discharges into the Yellowstone; permit renewed in 2010; mechanical plant w/ 2 primary clarifiers, 3 rotating biological contactors, UV, installing co-composting. DMR shows 11 mg/l TN average (20 mg/l for May) and 2 mg/l TP (3 mg/l for May).	Yes. Discharge into the Yellowstone River.	5	2	7,044	3,188	$35,689.00	$600.00	1.68%	Assume WERF Tier 1	95.00	$7,619,000	$1,223,300	$8,842,300	$2,774	$3,374	9.45	12.67	10.46	462%	
Miles City	2ndary treatment plus oxidation ditch. 2011 permit. Algae plant study to remove nutrients. Extended aeration system w/2 oxidation ditches w/rotating brush aerators; 2 clarifiers and chlorine basin. TN avg of 23.5 mg/l; TP avg. 3.6 mg/l.	Yes. Discharge into the Yellowstone River.	3.7	2	8,410	3,518	$37,554.00	$236.10	0.63%	Assume WERF Tier 1	70.30	$5,638,060	$1,223,300	$6,861,360	$1,950	$2,186	5.82	7.87	6.46	826%	
Hamilton	BNR facilitry. t w/ extended aeration system. Oxidation ditch w/ rorating brush aerators. 3 clarifiers. Upgraded in 2010. TN avg. 5.5 mg/l; TP avg. 5 mg/l.	Yes	1.98	0.68	4,348	2,092	$25,161.00	$276.00	1.10%	Assume WERF 2 (since TN gets to WERF 3 and TP WERF 1)	24.75	$3,017,124	$423,602	$3,440,726	$1,645	$1,921	7.63	10.39	8.49	596%	
Lewistown	BNR plant. Focus on TP removal. 0.8 mg/l TP; 3-4 mg/l TN.	Yes	2.5	1.5	5,901	2,727	$31,729.00	$387.60	1.22%	Assume WERF 3 based on current treatment levels	18.50	$2,786,950	$691,950	$3,478,900	$1,276	$1,663	5.24	6.79	5.73	329%	
Havre	Discharges into the Milk River. Permit renewed in 2011. Activated sludge facility with effluent chlorination. 2006-2010 data showed avg. TP of 3.4 (TN not required). 2011 DMR showed TN of 19.4 mg/l; Tp of 1.3 mg/l.	Yes	1.8	1.38	9,310	3,709	$43,577	$240.00	0.55%	Assumed WERF Level 1 and 5,000 gallons usage. Rate is $9.15 flat plus $2.15 per 1,000 gallons	$34.20	$2,742,840	$844,077	$3,586,917	$967	$1,207	2.77	3.58	3.02	403%	
Columbia Falls	Newer plant. Designed to achieve 8 mg/l TN	Yes	0.766	0.37	4,688	1,621	$38,750	$532.20	1.37%	Upgrade to RO	$10.65	$853,921	$938,600	$1,792,521	$1,106	$1,638	4.23	4.88	4.43	208%	
Manhattan	Discharges into Diva Ditch. Permit renewed in 2010. Denitrification with fixed film suspended growth system, clarifiers and aerobic sludge digestion, UV. DMR data from winter quarter shows 11 mg/l TN and 1 mg/l TP. 2008-2010 showed avg. TN of 14 mg/l TN and 4 mg/l TP.	Yes	0.6	0.4	1,520	523	$50,729	$362.40	0.71%	Assumed WERF Level 2. Correct? Paul.	$9.36	$750,672	$92,024	$842,696	$1,611	$1,974	3.89	5.25	4.32	445%	
Lolo	No steps towards nutrient removal. For Lolo, TN is generally less than 30 mg/l and TP less than 7. Generally heaving loadings for Lolo. Sewer rates--Lolo $30.25-ish/mo - (RSID) based on property values	Yes	0.34	0.38	3,892	1,060	$46,442	$363.00	0.78%	Level 1.	$6.46	$518,092	$232,427	$750,519	$708	$1,071	2.31	2.81	2.46	195%	
Stevensville	Stevensville is generally a little better with TN generally below 20 and TP less than 4.	Yes	0.3	0.29	1,809	795	$33,776	$535.08	1.58%		$3.75	$300,750	$125,512	$426,262	$536	$1,071	3.17	3.71	3.34	100%	
Philipsburg	lagoon to simple mechanical system - ref: Gary Swanson, consulting engineer- 15TN, 2TP	Yes.	0.2	0.2	820	399	$31,375.00	$200.00	0.64%	Assume WERF 1	$3.80	$ 304,760.00	561,650.00	$866,410.00	$2,171.45	$2,371	7.56	8.73	7.92	1086%	
Cut Bank	Lagoon.	Yes	0.643	0.643	2,869	1,290	$44,833	$138.48	0.31%	4000 gallons. Base rate $9.48 at 3000 gallons plus $2.06 for next 1,000 gallons	$14.02	$ 1,124,195.48	228,290.40	$1,352,485.88	$1,048.44	$1,187	2.65	3.58	2.94	757%	
Deer Lodge	Moving from an existing lagoon to mechanical plant with land application. Ref: planning document--To get to variance only. Because this would be a land application system,so theoretically, the N and P would be zero to the Clark Fork	Yes	3.3	1.06	3,111	1,522	$40,320	$409.56	1.02%	Moving from an existing lagoon to mechanical plant with land application. Ref: planning document--To get to variance only. Because this would be a land application system, so theoretically, the N and P would be zero to the Clark Fork	$71.94	$1,261,145.00	$555,493.00	$1,816,638.00	$1,193.59	$1,603	3.98			291%	
Glendive	domestic WW lagoon; 3 cell facultative; current O&M costs are <$; 8-10 capital costs for new plant. O&M increase of ~$300,000. new avg. 1.15 MGD; PER completed to upgrade to mechanical SBR or BNR plant.	Yes	1.3	0.6	4935	1883	$42,821	$213.96	0.50%		$36.79	$2,950,558.00	$391,740.00	$3,342,298.00	$1,774.99	$1,989	4.64	6.40	5.19	830%	
Redlodge	Lagoon.	Yes	1.2	0.65	2125	1055	$50,123	305.28	0.61%	Sewer Fee and MHI based on DEQ estimates. DEQ MHI value less than the 2010 USDA county data.	$26.16	$2,098,032.00	$308,132.50	$2,406,164.50	$2,280.72	$2,586	5.16	7.06	5.75	747%	
Big Fork	Lagoon.	Yes	0.5	0.3	4270	1708	$44,398	580.36	1.31%		$10.90	$874,180.00	$142,215.00	$1,016,395.00	$595.08	$1,175	2.65	3.20	2.82	103%	
Highwood	Lagoon.	Yes	0.026	0.015	176	53	$62,614	600.00	0.96%		$0.57	$45,457.36	$7,110.75	$52,568.11	$991.85	$1,592	2.54	3.20	2.75	165%	
Circle	Lagoon.	Yes	0.16	0.065	615	234	$29,000	259.56	0.90%		$3.49	$279,737.60	$30,813.25	$310,550.85	$1,327.14	$1,587	5.47	7.45	6.09	511%	

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NOTE: Operation costs include energy and chemical costs only and do not include labor and maintenance cost. As such, these numbers are on the low side.
NOTE: The numbers are intended to provide ROUGH ESTIMATES for discussion purposes and do not reflect the site-specific conditions at each plant.
NOTE: Capital costs were assumed to cover a 20-year bond with 5% interest (used 0.0802 conversion factor)
NOTE: MHI is based on data from Montana CEIC based on 2010 estimates.

Indicates rough estimates; need to verify
Big Fork number of household based on population divided by 2.5

WERF

Level	Description	Capital Cost ($/gpd)	Operations ($1/ MG/day Treated)
Level 1	No N and P removal	9.3	250
Level 2	1 mg/l TP; 8 mg/l TN	12.7	350
Level 3	0.1-0.3 mg/l TP; 4-8 mg/l TN	14.4	640
Level 4	<0.1 mg/l TP; 3 mg/l TN	15.3	880
100% RO	<0.01 mg/l TP; 1 mg/l TN	28.3	1860

Annualization Factor 0.0802

20 years, 5% rate	0.08024
20 years, 7% rate	0.09439

Costs to Meet Criteria	Capital Cost($million/MGD)	Design Flow	Facility Upgrade Capital Costs ($million)	Annualized Capital Costs (Assumed 20-yr bond & 5% interest; $million/year)	Annualized Capital Costs (Assumed 20-yr bond & 5% interest; $million/year)	Annualized Capital Costs + UNFUNDED projects (Assumed 20-yr bond & 5% interest; $million/year)	Operations ($1/ MG/day Treated)	Operations Costs ($/ year/ 1 MGD)	Actual Flow	Facility Upgrade Operations Costs (annual) based on Facility MGD	Membrane Replacement Cost ($24,000 /yr/1 MGD)*Actual Flow	Total Operations costs including membrane replacement	Total Operations costs including membrane replacement + Labor Low (15%)	Total Operations costs including membrane replacement + Labor Hi (48%)
Kalispell	15.6	5.4	$84.24	$6.76	$6,756,048.00	$8,815,277.56	1510	551,150.00	3.10	1,708,565.00	74,400.00	1,782,965.00	$2,796,372.20	$5,025,868.04
Bozeman	15.6	13.8	$215.28	$17.27	$17,265,456.00	$27,065,539.11	1510	551,150.00	5.80	3,196,670.00	139,200.00	3,335,870.00	$5,925,688.40	$11,623,288.88
Helena	19	5.4	$102.60	$8.23	$8,228,520.00	$9,284,486.77	1610	587,650.00	3.00	1,762,950.00	72,000.00	1,834,950.00	$3,069,228.00	$5,784,639.60
Butte	13.9	8.5	$118.15	$9.48	$9,475,630.00	$9,888,889.85	1220	445,300.00	4.00	1,781,200.00	96,000.00	1,877,200.00	$3,298,544.50	$6,425,502.40
Billings	19	25	$475.00	$38.10	$38,095,000.00	$41,497,567.61	1610	587,650.00	26.00	15,278,900.00	624,000.00	15,902,900.00	$21,617,150.00	$34,188,500.00
Missoula	7.4	12	$88.80	$7.12	$7,121,760.00	$8,560,301.30	1220	445,300.00	9.00	4,007,700.00	216,000.00	2,614,050.00	$3,682,314.00	$6,032,494.80
Great Falls	19	25	$475.00	$38.10	$38,095,000.00	$39,584,480.42	1610	587,650.00	26	15,278,900.00	624,000.00	$15,902,900.00	$21,617,150.00	$34,188,500.00
Livingston	19	5	$95.00	$7.62	$7,619,000.00	$8,420,701.58	1610	587,650.00	2.00	1,175,300.00	48,000.00	$1,223,300.00	$2,366,150.00	$4,880,420.00
Miles City	19	3.7	$70.30	$5.64	$5,638,060.00	$5,638,060.00	1610	587,650.00	2.00	1,175,300.00	48,000.00	$1,223,300.00	$2,069,009.00	$3,929,568.80
Hamilton	19	1.98	$37.62	$3.02	$3,017,124.00	$3,552,780.04	1610	587,650.00	0.68	399,602.00	24,000.00	423,602.00	$876,170.60	$1,871,821.52
Lewistown	13.9	2.5	$34.75	$2.79	$2,786,950.00	$3,381,497.94	1220	445,300.00	1.50	667,950.00	24,000.00	691,950.00	$1,109,992.50	$2,029,686.00
Havre	19	1.8	$34.20	$2.74	$2,742,840.00	$3,223,771.17	1610	587,650.00	1.38	810,957.00	33,120.00	$844,077.00	$1,255,503.00	$2,160,640.20
Columbia Falls	13.9	0.766	$10.65	$0.85	$853,921.48	$1,015,474.60	1220	445,300.00	2.00	890,600.00	48,000.00	$938,600.00	$1,066,688.22	$1,348,482.31
Manhattan	15.6	0.6	$9.36	$0.75	$750,672.00	$957,885.70	1510	551,150.00	0.16	88,184.00	3,840.00	$92,024.00	$204,624.80	$452,346.56
Lolo	19	0.34	$6.46	$0.52	$518,092.00	$1,395,898.48	1610	587,650.00	0.38	223,307.00	9,120.00	$232,427.00	$310,140.80	$481,111.16
Stephensville	12.5	0.3	$3.75	$0.30	$300,750.00	$507,963.70	1120	408,800.00	0.29	118,552.00	6,960.00	$125,512.00	$170,624.50	$269,872.00
Philipsburg	19	0.2	$3.80	$0.30	$304,760.00	$304,760.00	1610	587,650.00	1.00	587,650.00	24,000.00	$561,650.00	$607,364.00	$707,934.80
Cut Bank	21.8	0.643	$14.02	$1.12	$1,124,195.48	$1,178,825.15	1120	408,800.00	0.64	262,858.40	15,432.00	$228,290.40	$396,919.72	$767,904.23
Deer Lodge	21.8	3.3	$71.94	$5.77	$5,769,588.00	$6,298,636.52	1370	500,050.00	1.06	530,053.00	25,440.00	$555,493.00	$1,420,931.20	$3,324,895.24
Glendive	28.3	1.3	$36.79	$2.95	$2,950,558.00	$3,088,079.83	1860	628,900.00	0.6	377,340.00	14,400.00	$391,740.00	$834,323.70	$1,808,007.84
Red Lodge	21.8	1.2	$26.16	$2.10	$2,098,032.00	$2,098,032.00	1370	450,050.00	0.65	292,532.50	15,600.00	$308,132.50	$622,837.30	$1,315,187.86
Big Fork	21.8	0.5	$10.90	$0.87	$874,180.00	$874,180.00	1370	450,050.00	0.30	135,015.00	7,200.00	$142,215.00	$273,342.00	$561,821.40
Highwood	21.8	0.026	$0.57	$0.05	$45,457.36	$45,457.36	1370	450,050.00	0.015	6,750.75	360.00	$7,110.75	$13,929.35	$28,930.28
Circle	21.8	0.16	$3.49	$0.28	$279,737.60	$439,990.59	1370	450,050.00	0.065	29,253.25	1,560.00	$30,813.25	$72,773.89	$165,087.30

Community	Current Treatment Technology	Would the criteria apply? Or is there dilution capability?	Design Flow (MGD)	Actual Flow (MGD)	Community Population (Census 2010)	Number of Households (American Community Survey 2005-2009)	Median Household Income (2010) - American Community Survey.	Current average household sewer bill per year (2008 / 2011)	Current average sewer fee as % of MHI	Notes	Capital cost (million dollars) to meet the numeric nutrient criteria (WERF)	Annual Capital cost to meet the numeric nutrient criteria (L4 WERF)	Annual Operations costs to meet the numeric nutrient criteria L4WERF	Annual Capital and Operations cost ($)	Annual Additional Cost per Household (increase in sewer rate)	Predicted average household sewer fee to meet criteria	Scenario C	Scenario D	Scenario E	Percent increase in Wastewater bill	
Kalispell	BNR (modified Johannesburg); 3.1 to 5.4 MGD; avg. .12 mg/l TP; 10 mg/l TN.	Yes. EOP; Ashley Creek	5.4	3.10	19,927	7,705	$39,953.00	$361.68	0.91%	Sewer rates obtained from City in 2011. Plant ~WERF Level 2.	84.24	$7,951,660	$1,782,965	$9,734,625	$1,263	$1,625	4.07	5.31	4.45	349%	
Bozeman	some BNR now; 5-stage Barrdenpho; new plant will be BNR (1 mg/l TP; 3 mg/l TN starting in 2011); current 5.8 MGD; increasing to 13.9 mgd	Yes. Also Gallatin TMDL in the works.	13.8	5.80	37,280	14,614	$41,661.00	$372.00	0.89%	Sewer rates obtained from City in 2011. Plant ~WERF Level 2. Really Level 3 for TN and 1 for TP	215.28	$20,320,909	$3,335,870	$23,656,779	$1,619	$1,991	4.78	6.38	5.28	435%	
Helena	BNR; 3 mg/l TP; 10 mg/l TN; design capacity of 5.4; current discharge ~3.0 MGD	Yes. WLA set in TMDL based on numeric criteria.	5.4	3.00	28,190	12,337	$47,152.00	$277.80	0.59%	Sewer rates obtained from City in 2011. Plant ~ WERF Level 1.	102.60	$9,684,714	$1,834,950	$11,519,664	$934	$1,212	2.57	3.37	2.82	336%	
Butte	Current technology is activated sludge (TN of 18.5 mg/l; TP of 2.11 mg/l); under Order to Construct to membrane BNR; current design is 8.5 MGD; talking about lowering to 6.1 MGD. Sewer Fee based on DEQ estimtes. Included in current fee is $27 million upgrade in new capital costs and $1.125 million in O&M costs which would bring them to 5 TN and 0.1 TP	Yes. EOP.	8.5	4.00	33,525	14,041	$37,335.00	$360.00	0.96%	Sewer Fee based on DEQ estimtes. While current monthly fee is $13.50, the $27 million upgrade in new capital costs plus $1.125 million in additional O&M costs which would bring them to 5 TN and 0.1 TP (WERF 3) would raise rates to $30 per month	118.15	$11,152,524	$1,877,200	$13,029,724	$928	$1,288	3.45	4.47	3.77	258%	
Billings	2ndary treatment; Design flow of 26 MGD (avg.) and 40 MGD max.	Yes. Discharge into the Yellowstone River.	26	26	104,170	41,841	$45,004.00	$218.28	0.49%	The numbers for Billings and Great Falls (treatment levels, treatment costs etc.) were obtained from HDR.	312.50	$44,836,640	$15,902,900	$60,739,540	$1,452	$1,670	3.71	4.85	4.07	665%	
Missoula	advanced secondary treatment facility with biological nutrient removal and ultraviolet disinfection; meets Clark Fork criteria w/ mixing zone. 8.2 mg/l TN; 0.16 -0.4 mg/l TP; get a mixing zone, meeting criteria currently. BNR. Design flow = 12 MGD ; actual flow = 9 MGD. (designed for 10 and 1). (HDR)	Yes. With mixing zone. Currently meeting criteria after mixing zone.	12	9	66,788	27,553	$34,319.00	$152.14	0.44%	Sewer rates obtained from city. 2011 values.	88.80	$8,382,092	$2,614,050	$10,996,142	$399	$551	1.61	2.03	1.74	262%	
Great Falls	conventional 2ndary activated sludge (max 21-MGD; avg. 10 MGD)	Yes. Missouri River	26	26	58,505	23,998	$40,718.00	$187.20	0.46%	At WERF 1. The numbers for Billings and Great Falls (population, treatment levels, etc.) were obtained from HDR.	312.50	$44,836,640	$15,902,900	$60,739,540	$2,531	$2,718	6.68	8.88	7.36	1352%	
Livingston	discharges into the Yellowstone; permit renewed in 2010; mechanical plant w/ 2 primary clarifiers, 3 rotating biological contactors, UV, installing co-composting. DMR shows 11 mg/l TN average (20 mg/l for May) and 2 mg/l TP (3 mg/l for May).	Yes. Discharge into the Yellowstone River.	5	2	7,044	3,188	$35,689.00	$600.00	1.68%	Assume WERF Tier 1	95.00	$8,967,328	$1,223,300	$10,190,628	$3,197	$3,797	10.64	14.42	11.82	533%	
Miles City	2ndary treatment plus oxidation ditch. 2011 permit. Algae plant study to remove nutrients. Extended aeration system w/2 oxidation ditches w/rotating brush aerators; 2 clarifiers and chlorine basin. TN avg of 23.5 mg/l; TP avg. 3.6 mg/l.	Yes. Discharge into the Yellowstone River.	3.7	2	8,410	3,518	$37,554.00	$236.10	0.63%	Assume WERF Tier 1	70.30	$6,635,823	$1,223,300	$7,859,123	$2,234	$2,470	6.58	8.99	7.33	946%	
Hamilton	BNR facilitry. t w/ extended aeration system. Oxidation ditch w/ rorating brush aerators. 3 clarifiers. Upgraded in 2010. TN avg. 5.5 mg/l; TP avg. 5 mg/l.	Yes	1.98	0.68	4,348	2,092	$25,161.00	$276.00	1.10%	Assume WERF 2 (since TN gets to WERF 3 and TP WERF 1)	24.75	$3,551,062	$423,602	$3,974,664	$1,900	$2,176	8.65	11.89	9.66	688%	
Lewistown	BNR plant. Focus on TP removal. 0.8 mg/l TP; 3-4 mg/l TN.	Yes	2.5	1.5	5,901	2,727	$31,729.00	$387.60	1.22%	Assume WERF 3 based on current treatment levels	18.50	$3,280,154	$691,950	$3,972,104	$1,457	$1,844	5.81	7.63	6.38	376%	
Havre	Discharges into the Milk River. Permit renewed in 2011. Activated sludge facility with effluent chlorination. 2006-2010 data showed avg. TP of 3.4 (TN not required). 2011 DMR showed TN of 19.4 mgl; Tp of 1.3 mg/l.	Yes	1.8	1.38	9,310	3,709	$43,577	$240.00	0.55%	Assumed WERF Level 1 and 5,000 gallons usage. Rate is $9.15 flat plus $2.15 per 1,000 gallons	$34.20	$3,228,238	$844,077	$4,072,315	$1,098	$1,338	3.07	4.03	3.37	457%	265-6719 - City Office
Columbia Falls	Newer plant. Designed to achieve 8 mg/l TN	Yes	0.766	0.37	4,688	1,621	$38,750	$532.20	1.37%	Upgrade to RO	$10.65	$1,005,039	$938,600	$1,943,639	$1,199	$1,731	4.47	5.24	4.71	225%	
Manhattan	Discharges into Diva Ditch. Permit renewed in 2010. Denitrification with fixed film suspended growth system, clarifiers and aerobic sludge digestion, UV. DMR data from winter quarter shows 11 mg/l TN and 1 mg/l TP. 2008-2010 showed avg. TN of 14 mg/l TN and 4 mg/l TP.	Yes	0.6	0.4	1,520	523	$50,729	$362.40	0.71%	Assumed WERF Level 2. Correct? Paul.	$9.36	$883,518	$92,024	$975,542	$1,865	$2,228	4.39	5.99	4.89	515%	
Lolo	Lolo, TN is generally less than 30 mg/l and TP less than 7. Generally heaving loadings for Lolo. Sewer rates--Lolo $30.25-ish/mo - (RSID) based on property values	Yes	0.34	0.38	3,892	1,060	$46,442	$363.00	0.78%	Level 1.	$6.46	$609,778	$232,427	$842,205	$795	$1,158	2.49	3.09	2.68	219%	
Stevensville	Stevensville is generally a little better with TN generally below 20 and TP less than 4.	Yes	0.3	0.29	1,809	795	$33,776	$535.08	1.58%		$3.75	$353,973	$125,512	$479,485	$603	$1,138	3.37	4.00	3.57	113%	
Philipsburg	lagoon to simple mechanical system - ref: Gary Swanson, consulting engineer- 15TN, 2TP	Yes.	0.2	0.2	820	399	$31,375.00	$200.00	0.64%	Assume WERF 1	$19.00	$ 1,793,465.59	561,650.00	$2,355,115.59	$5,902.55	$6,103	19.45	26.33	21.60	2951%	
Cut Bank	Lagoon.	Yes	0.643	0.643	2,869	1,290	$44,833	$138.48	0.31%	4000 gallons. Base rate $9.48 at 3000 gallons plus $2.06 for next 1,000 gallons	$14.02	$ 1,323,143.40	228,290.40	$1,551,433.80	$1,202.66	$1,341	2.99	4.09	3.33	868%	
Deer Lodge	Moving from an existing lagoon to mechanical plant with land application. Ref: planning document--To get to variance only. Because this would be a land application system, so theoretically, the N and P would be zero to the Clark Fork	Yes	3.3	1.06	3,111	1,522	$40,320	$409.56	1.02%	Moving from an existing lagoon to mechanical plant with land application. Ref: planning document--To get to variance only. Because this would be a land application system, so theoretically, the N and P would be zero to the Clark Fork	$71.94	$1,484,282.75	$555,493.00	$2,039,775.75	$1,340.19	$1,750	4.34			327%	
Glendive	domestic WW lagoon; 3 cell facultative; current O&M costs are <$; 8-10 capital costs for new plant. O&M increase of ~$300,000. new avg. 1.15 MGD; PER completed to upgrade to mechanical SBR or BNR plant.	Yes	1.3	0.6	4935	1883	$42,821	$213.96	0.50%		$36.79	$3,472,715.74	$391,740.00	$3,864,455.74	$2,052.29	$2,266	5.29	7.36	5.94	959%	

Redlodge	Lagoon.	Yes	1.2	0.65	2125	1055	$50,123	305.28	0.61%	Sewer Fee and MHI based on DEQ estimates. DEQ MHI value less than the 2010 USDA county data.	$26.16	$2,469,318.94	$308,132.50	$2,777,451.44	$2,632.66	$2,938	**5.86**	**8.10**	**6.56**	862%
Big Fork	Lagoon.	Yes	0.5	0.3	4270	1708	$44,398	580.36	1.31%		$10.90	$1,028,882.89	$142,215.00	$1,171,097.89	$685.65	$1,266	**2.85**	**3.50**	**3.06**	118%
Highwood	Lagoon.	Yes	0.026	0.015	176	53	$62,614	600.00	0.96%		$0.57	$53,501.91	$7,110.75	$60,612.66	$1,143.64	$1,744	**2.78**	**3.56**	**3.03**	191%
Circle	Lagoon.	Yes	0.16	0.065	615	234	$29,000	259.56	0.90%		$3.49	$329,242.52	$30,813.25	$360,055.77	$1,538.70	$1,798	**6.20**	**8.53**	**6.93**	593%

NOTE: Operation costs include energy and chemical costs only and do not include labor and maintenance cost. As such, these numbers are on the low side.
NOTE: The numbers are intended to provide ROUGH ESTIMATES for discussion purposes and do not reflect the site-specific conditions at each plant.
NOTE: Capital costs were assumed to cover a 20-year bond with 7% interest (used 0.0802 conversion factor)
NOTE: MHI is based on data from Montana CEIC based on 2010 estimates.

Indicates rough estimates; need to verify
Big Fork number of household based on population divided by 2.5

WERF

Level	Description	Capital Cost ($/gpd)	Operations ($1/ MG/day Treated)
Level 1	No N and P removal	9.3	250
Level 2	1 mg/l TP; 8 mg/l TN	12.7	350
Level 3	0.1-0.3 mg/l TP; 4-8 mg/l TN	14.4	640
Level 4	<0.1 mg/l TP; 3 mg/l TN	15.3	880
100% RO	<0.01 mg/l TP; 1 mg/l TN	28.3	1860

Annualization Factor 0.09439

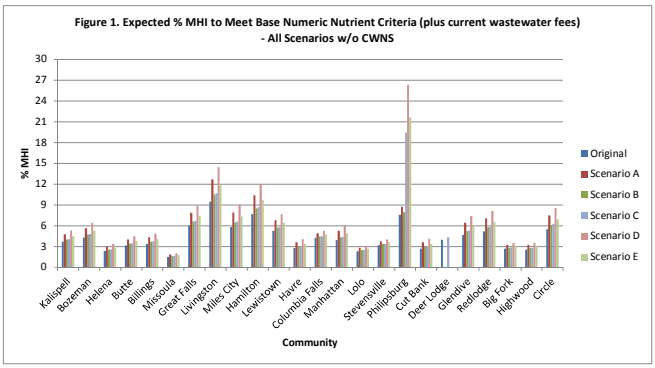
20 years, 5% rate	0.08024
20 years, 7% rate	0.09439

Costs to Meet Criteria	Capital Cost($million/MGD)	Design Flow	Facility Upgrade Capital Costs ($million)	Annualized Capital Costs (Assumed 20-yr bond & 5% interest; $million/year)	Annualized Capital Costs (Assumed 20-yr bond & 5% interest; $million/year)	Annualized Capital Costs + UNFUNDED projects (Assumed 20-yr bond & 5% interest; $million/year)	Operations ($1/ MG/day Treated)	Operations Costs ($/ year/ 1 MGD)	Actual Flow	Facility Upgrade Operations Costs (annual) based on Facility MGD	Membrane Replacement Cost ($24,000 /yr/1 MGD)*Actual Flow	Total Operations costs including membrane replacement	Total Operations costs including membrane replacement + Labor Low (15%)	Total Operations costs including membrane replacement + Labor Hi (48%)
Kalispell	15.6	5.4	$84.24	$7.95	$7,951,660.06	$10,375,309.72	1510	551,150.00	3.10	1,708,565.00	74,400.00	1,782,965.00	$2,975,714.01	$5,599,761.83
Bozeman	15.6	13.8	$215.28	$20.32	$20,320,909.05	$31,855,304.53	1510	551,150.00	5.80	3,196,670.00	139,200.00	3,335,870.00	$6,384,006.36	$13,089,906.35
Helena	19	5.4	$102.60	$9.68	$9,684,714.18	$10,927,554.50	1610	587,650.00	3.00	1,762,950.00	72,000.00	1,834,950.00	$3,287,657.13	$6,483,612.81
Butte	13.9	8.5	$118.15	$11.15	$11,152,524.18	$11,638,918.27	1220	445,300.00	4.00	1,781,200.00	96,000.00	1,877,200.00	$3,550,078.63	$7,230,411.60
Billings	19	25	$475.00	$44.84	$44,836,639.73	$48,841,356.83	1610	587,650.00	26.00	15,278,900.00	624,000.00	15,902,900.00	$22,628,395.96	$37,424,487.07
Missoula	7.4	12	$88.80	$8.38	$8,382,091.81	$10,075,210.54	1220	445,300.00	9.00	4,007,700.00	216,000.00	2,614,050.00	$3,871,363.77	$6,637,454.07
Great Falls	19	25	$475.00	$44.84	$44,836,639.73	$46,589,712.22	1610	587,650.00	26	15,278,900.00	624,000.00	$15,902,900.00	$22,628,395.96	$37,424,487.07
Livingston	19	5	$95.00	$8.97	$8,967,327.95	$9,910,905.97	1610	587,650.00	2.00	1,175,300.00	48,000.00	$1,223,300.00	$2,568,399.19	$5,527,617.41
Miles City	19	3.7	$70.30	$6.64	$6,635,822.68	$6,635,822.68	1610	587,650.00	2.00	1,175,300.00	48,000.00	$1,223,300.00	$2,218,673.40	$4,408,494.89
Hamilton	19	1.98	$37.62	$3.55	$3,551,061.87	$4,181,512.50	1610	587,650.00	0.68	399,602.00	24,000.00	423,602.00	$956,261.28	$2,128,111.70
Lewistown	13.9	2.5	$34.75	$3.28	$3,280,154.17	$3,979,918.76	1220	445,300.00	1.50	667,950.00	24,000.00	691,950.00	$1,183,973.13	$2,266,424.00
Havre	19	1.8	$34.20	$3.23	$3,228,238.06	$3,794,279.21	1610	587,650.00	1.38	810,957.00	33,120.00	$844,077.00	$1,328,312.71	$2,393,631.27
Columbia Falls	13.9	0.766	$10.65	$1.01	$1,005,039.24	$1,195,182.27	1220	445,300.00	2.00	890,600.00	48,000.00	$938,600.00	$1,089,355.89	$1,421,018.83
Manhattan	15.6	0.6	$9.36	$0.88	$883,517.78	$1,127,401.92	1510	551,150.00	0.16	88,184.00	3,840.00	$92,024.00	$224,551.67	$516,112.54
Lolo	19	0.34	$6.46	$0.61	$609,778.30	$1,642,929.45	1610	587,650.00	0.38	223,307.00	9,120.00	$232,427.00	$323,893.75	$525,120.58
Stephensville	12.5	0.3	$3.75	$0.35	$353,973.47	$597,857.61	1120	408,800.00	0.29	118,552.00	6,960.00	$125,512.00	$178,608.02	$295,419.27
Philipsburg	19	1	$19.00	$1.79	$1,793,465.59	$1,793,465.59	1610	587,650.00	1.00	587,650.00	24,000.00	$561,650.00	$830,669.84	$1,422,513.48
Cut Bank	21.8	0.643	$14.02	$1.32	$1,323,143.40	$1,387,440.84	1120	408,800.00	0.64	262,858.40	15,432.00	$228,290.40	$426,761.91	$863,399.23
Deer Lodge	21.8	3.3	$71.94	$6.79	$6,790,627.08	$7,413,300.87	1370	500,050.00	1.06	530,053.00	25,440.00	$555,493.00	$1,574,087.06	$3,814,994.00
Glendive	28.3	1.3	$36.79	$3.47	$3,472,715.74	$3,634,574.69	1860	628,900.00	0.6	377,340.00	14,400.00	$391,740.00	$912,647.36	$2,058,643.55
Red Lodge	21.8	1.2	$26.16	$2.47	$2,469,318.94	$2,469,318.94	1370	450,050.00	0.65	292,532.50	15,600.00	$308,132.50	$678,530.34	$1,493,405.59
Big Fork	21.8	0.5	$10.90	$1.03	$1,028,882.89	$1,028,882.89	1370	450,050.00	0.30	135,015.00	7,200.00	$142,215.00	$296,547.43	$636,078.79
Highwood	21.8	0.026	$0.57	$0.05	$53,501.91	$53,501.91	1370	450,050.00	0.015	6,750.75	360.00	$7,110.75	$15,136.04	$32,791.67
Circle	21.8	0.16	$3.49	$0.33	$329,242.52	$517,855.35	1370	450,050.00	0.065	29,253.25	1,560.00	$30,813.25	$80,199.63	$188,849.66

	7%	CWNS	Labor low	Labor High
Original	0	0	0	0
Scenario A	0	0	0	1
Scenario B	0	0	1	0
Scenario C	1	0	0	0
Scenario D	1	0	0	1
Scenario E	1	0	1	0

Community	Original	Scenario A	Scenario B	Scenario C	Scenario D	Scenario E
Kalispell	3.68	4.73	4.01	4.07	5.31	4.45
Bozeman	4.28	5.64	4.70	4.78	6.38	5.28
Helena	2.32	3.00	2.53	2.57	3.37	2.82
Butte	3.13	4.00	3.40	3.45	4.47	3.77
Billings	3.35	4.32	3.66	3.71	4.85	4.07
Missoula	1.47	1.83	1.59	1.61	2.03	1.74
Great Falls	5.99	7.86	6.57	6.68	8.88	7.36
Livingston	9.45	12.67	10.46	10.64	14.42	11.82
Miles City	5.82	7.87	6.46	6.58	8.99	7.33
Hamilton	7.63	10.39	8.49	8.65	11.89	9.66
Lewistown	5.24	6.79	5.73	5.81	7.63	6.38
Havre	2.77	3.58	3.02	3.07	4.03	3.37
Columbia Falls	4.23	4.88	4.43	4.47	5.24	4.71
Manhattan	3.89	5.25	4.32	4.39	5.99	4.89
Lolo	2.31	2.81	2.46	2.49	3.09	2.68
Stevensville	3.17	3.71	3.34	3.37	4.00	3.57
Philipsburg	7.56	8.73	7.92	19.45	26.33	21.60
Cut Bank	2.65	3.58	2.94	2.99	4.09	3.33
Deer Lodge	3.98			4.34		
Glendive	4.64	6.40	5.19	5.29	7.36	5.94
Redlodge	5.16	7.06	5.75	5.86	8.10	6.56
Big Fork	2.65	3.20	2.82	2.85	3.50	3.06
Highwood	2.54	3.20	2.75	2.78	3.56	3.03
Circle	5.47	7.45	6.09	6.20	8.53	6.93

NOTE: Capital costs were assumed to cover a 20-year bond with 5% interest (used 0.0802 conversion factor)
NOTE: MHI is based on data from Montana CEIC based on 2010 estimates.



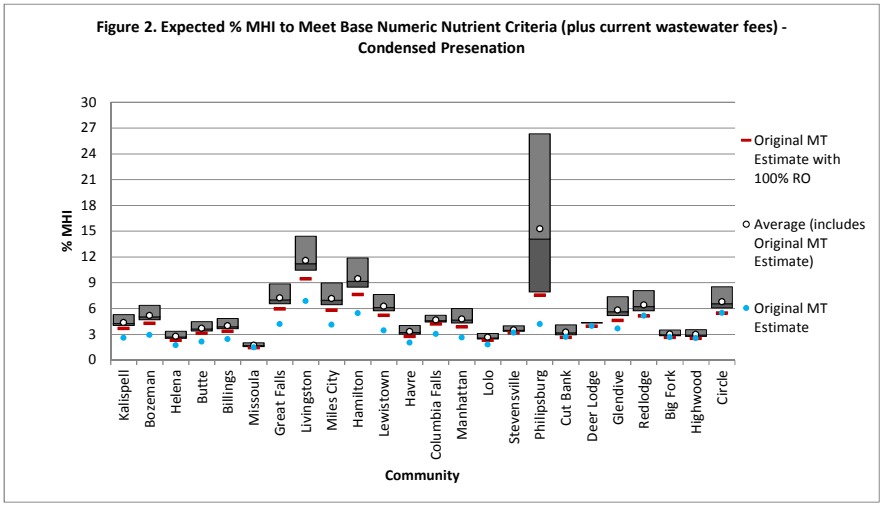
Community	Original	Min (excludes original)	Average	Max (excludes origina	Median
Kalispell	3.68	4.01	4.37	5.31	4.26
Bozeman	4.28	4.70	5.18	6.38	5.03
Helena	2.32	2.53	2.77	3.37	2.69
Butte	3.13	3.40	3.70	4.47	3.61
Billings	3.35	3.66	3.99	4.85	3.89
Missoula	1.47	1.59	1.71	2.03	1.67
Great Falls	5.99	6.57	7.22	8.88	7.02
Livingston	9.45	10.46	11.58	14.42	11.23
Miles City	5.82	6.46	7.18	8.99	6.95
Hamilton	7.63	8.49	9.45	11.89	9.15
Lewistown	5.24	5.73	6.26	7.63	6.10
Havre	2.77	3.02	3.31	4.03	3.22
Columbia Falls	4.23	4.43	4.66	5.24	4.59
Manhattan	3.89	4.32	4.79	5.99	4.64
Lolo	2.31	2.46	2.64	3.09	2.59
Stevensville	3.17	3.34	3.53	4.00	3.47
Philipsburg	7.56	7.92	15.26	26.33	14.09
Cut Bank	2.65	2.94	3.26	4.09	3.16
Deer Lodge	3.98	4.34	4.16	4.34	4.16
Glendive	4.64	5.19	5.81	7.36	5.62
Redlodge	5.16	5.75	6.42	8.10	6.21
Big Fork	2.65	2.82	3.01	3.50	2.95
Highwood	2.54	2.75	2.98	3.56	2.91
Circle	5.47	6.09	6.78	8.53	6.56

NOTE: Capital costs were assumed to cover a 20-year bond with 5% interest (used 0.0802 conversion factor)
NOTE: MHI is based on data from Montana CEIC based on 2010 estimates.

Community	Original MT Estimate	Original MT Estimate with 100% RO	Average (in
Kalispell	2.58	3.68	4.37
Bozeman	2.92	4.28	5.18
Helena	1.74	2.32	2.77
Butte	2.15	3.13	3.70
Billings	2.41	3.35	3.99
Missoula	1.47	1.47	1.71
Great Falls	4.18	5.99	7.22
Livingston	6.85	9.45	11.58
Miles City	4.09	5.82	7.18
Hamilton	5.44	7.63	9.45
Lewistown	3.42	5.24	6.26
Havre	2.04	2.77	3.31
Columbia Falls	3.02	4.23	4.66
Manhattan	2.60	3.89	4.79
Lolo	1.81	2.31	2.64
Stevensville	3.17	3.17	3.53
Philipsburg	4.19	7.56	15.26
Cut Bank	2.68	2.65	3.26
Deer Lodge	3.98	3.98	
Glendive	3.67	4.64	5.81
Redlodge	5.16	5.16	6.42
Big Fork	2.65	2.65	3.01
Highwood	2.54	2.54	2.98
Circle	5.47	5.47	6.78

NOTE: Capital costs were assumed to cover a 20-year bond with 5% interest (used 0.0802 c
NOTE: MHI is based on data from Montana CEIC based on 2010 estimates.

Min (excludes Original	Max (excludes Origin	Median (includes Original MT Estimate)
4.01	1.05	0.25
4.70	1.35	0.33
2.53	0.67	0.16
3.40	0.86	0.21
3.66	0.96	0.23
1.59	0.36	0.09
6.57	1.86	0.45
10.46	3.19	0.77
6.46	2.03	0.49
8.49	2.73	0.66
5.73	1.54	0.37
3.02	0.81	0.20
4.43	0.65	0.16
4.32	1.35	0.33
2.46	0.50	0.12
3.34	0.53	0.13
7.92	12.24	6.17
2.94	0.93	0.22
4.34	0.01	
5.19	1.74	0.42
5.75	1.89	0.46
2.82	0.55	0.13
2.75	0.65	0.16
6.09	1.96	0.48



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